CLAIMS:

1. A method of establishing wireless communications between an interrogator and individual multiple wireless identification devices, the method comprising combining tree search and Aloha methods to establish communications between the interrogator and individual of multiple wireless identification devices.

2. A method in accordance with claim 1 wherein the combined Aloha methods are slotted Aloha methods.

3. A method in accordance with claim 1 wherein the wireless identification device comprises an integrated circuit including a receiver, a modulator, and a microprocessor in communication with the receiver and modulator.

4. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices, the method comprising:

establishing a first predetermined number of bits to be used as unique identification numbers, and establishing for respective devices unique identification numbers respectively having the first predetermined number of bits;

establishing a second predetermined number of bits to be used for random values;

causing the devices to select random values, wherein respective devices choose random values independently of random values selected by the other devices;

transmitting a command from the interrogator requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

receiving the command at multiple devices, the devices receiving the command respectively determining if the random value chosen by the command falls within the specified group and, if so, sending a reply to the interrogator within a randomly selected time slot of a number of slots; and, if not, not sending a reply; and

determining with the interrogator if a collision occurred between devices that sent a reply and, if so, creating a new, smaller, specified group.

5. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein the sending of a reply to the interrogator within a randomly selected time slot is in accordance with an Aloha method.

6. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein the sending of a reply to the interrogator within a randomly selected time slot is in accordance with a slotted Aloha method.

7. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein the method is an adaptive method.

8. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein the number of slots is four.

9. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein sending a reply to the interrogator comprises transmitting the unique identification number of the device sending the reply.

10. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein sending a reply to the interrogator comprises transmitting the random value of the device sending the reply.

11. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein, after receiving a reply without collision from a device, the interrogator sends a command individually addressed to that device.

12. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 4 wherein the time slot randomly selected by a device is selected using a random number different from the random value of that device.

13. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices, the method comprising:

establishing unique identification numbers for respective devices;

causing the devices to select random values, wherein respective devices choose random values independently of random values selected by the other devices;

transmitting from the interrogator a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

receiving the command at multiple devices, the devices receiving the command respectively determining if the random value chosen by the device falls within the specified group and, if so, sending a reply to the interrogator within a randomly selected time slot of a number of slots; and, if not, not sending a reply; and

determining using the interrogator if a collision occurred between devices that sent a reply and, if so, creating a new, smaller, specified group.

14. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 13 wherein establishing unique identification numbers for respective devices comprises establishing a predetermined number of bits to be used for the unique identification numbers.

15. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 14 and further including establishing a predetermined number of bits to be used for the random values.

16. A method of addressing messages from an interrogator to a selected one or more of a number of communications devices in accordance with claim 15 wherein the predetermined number of bits to be used for the random values comprises sixteen bits.

17. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices, the method comprising:

establishing for respective devices unique identification numbers respectively having a first predetermined number of bits;

establishing a second predetermined number of bits to be used for random values;

causing the devices to select random values, wherein respective devices choose random values independently of random values selected by the other devices;

transmitting from the interrogator a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

receiving the command at multiple devices, the devices receiving the command respectively determining if the random values chosen by the device falls within the specified group and, if so, sending a reply to the interrogator within a randomly selected time slot of a number of possible time slots, in accordance with an Aloha method; and, if not, not sending a reply, wherein sending a reply to the interrogator comprises transmitting both the random value of the device sending the reply and the unique identification number of the device sending the reply, and wherein

the time slot randomly selected by a device is selected using a random number different from the random value of that device;

determining with the interrogator if a collision occurred between devices that sent a reply and, if so, creating a new, smaller, specified group; and

if a reply without collision is received from a device, the interrogator subsequently sending a command individually addressed to that device.

18. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices in accordance with claim 17 wherein the number of possible time slots is four.

19. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices in accordance with claim 17 wherein the number of possible time slots is four, wherein the first predetermined number of bits is sixteen, and wherein the second predetermined number of bits is sixteen.

20. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices in accordance with claim 17 wherein the number of possible slots varies from one specified group to another.

21. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices in accordance with claim 17 and further comprising, after creating a new, smaller, specified group:

the interrogator transmitting a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values; and

devices receiving the command respectively determining if their chosen random values fall within the new smaller specified group and, if so, sending a reply to the interrogator within a randomly selected time slot of a number of possible time slots, in accordance with an Aloha method.

22. A method of addressing messages from an interrogator to a selected one or more of a number of RFID devices in accordance with claim 21 and further comprising the subsequent steps of the interrogator determining if a collision occurred between devices that sent a reply and, if so, creating a new specified group and repeating the transmitting of the command requesting devices having random values within a specified group of random values to respond using different specified groups until all devices are identified, for every command the devices receiving the command determining if their chosen random values fall within the specified group and, if so, sending a reply to the interrogator within a randomly selected time slot of a number of possible time slots, in accordance with an Aloha method.

23. A communications system comprising an interrogator, and a plurality of wireless identification devices configured to communicate with the interrogator in a wireless fashion, the respective wireless identification devices having a unique identification number, the interrogator being configured to employ tree search and Aloha techniques to determine the unique identification numbers of the different wireless identification devices so as to be able to establish communications between the interrogator and individual ones of the multiple wireless identification devices without collision by multiple wireless identification devices attempting to respond to the interrogator at the same time.

24. A communications system in accordance with claim 23 wherein the Aloha technique is a slotted Aloha technique.

25. A communications system in accordance with claim 23 wherein the wireless identification device comprises an integrated circuit including a receiver, a modulator, and a microprocessor in communication with the receiver and modulator.

26. A system comprising:

an interrogator;

a number of communications devices capable of wireless communications with the interrogator;

means for establishing a first predetermined number of bits to be used as unique identification numbers, and for establishing for respective devices unique identification numbers respectively having the first predetermined number of bits;

means for establishing a second predetermined number of bits to be used for random values;

means for causing the devices to select random values, wherein respective devices choose random values independently of random values selected by the other devices;

means for causing the interrogator to transmit a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

means for causing devices receiving the command to determine if their chosen random values fall within the specified group and, if so, send a reply to the interrogator within a randomly selected time slot of a number of slots; and, if not, not send a reply; and

means for causing the interrogator to determine if a collision occurred between devices that sent a reply and, if so, create a new, smaller, specified group.

27. A system in accordance with claim 26 wherein the sending of a reply to the interrogator within a randomly selected time slot is in accordance with an Aloha technique.

28. A system in accordance with claim 26 wherein the sending of a reply to the interrogator within a randomly selected time slot is in accordance with a slotted Aloha technique.

29. A system in accordance with claim 26 wherein the number of slots is four.

30. A system in accordance with claim 26 wherein sending a reply to the interrogator comprises transmitting the unique identification number of the device sending the reply.

31. A system in accordance with claim 26 wherein sending a reply to the interrogator comprises transmitting the random value of the device sending the reply.

32. A system in accordance with claim 26 wherein sending a reply to the interrogator comprises transmitting both the random value of the device sending the reply and the unique identification number of the device sending the reply.

33. A system in accordance with claim 26 wherein the interrogator further includes means for, after receiving a reply without collision from a device, sending a command individually addressed to that device.

34. A system in accordance with claim 26 wherein the time slot randomly selected by a device is selected using a random number different from the random value of that device.

35. A system comprising:

an interrogator configured to communicate to a selected one or more of a number of communications devices;

a plurality of communications devices;

the devices being configured to select random values, wherein respective devices choose random values independently of random values selected by the other devices;

the interrogator being configured to transmit a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

devices receiving the command being configured to respectively determine if their chosen random values fall within the specified group and, if so, send a reply to the interrogator within a randomly selected time slot of a number of slots; and, if not, not send a reply; and

the interrogator being configured to determine if a collision occurred between devices that sent a reply and, if so, create a new, smaller, specified group.

36. A system in accordance with claim 35 wherein the predetermined number of bits to be used for the random values comprises sixteen bits.

37. A system comprising:

an interrogator configured to communicate to a selected one or more of a number of communications devices;

a plurality of communications devices, respective devices being configured to store unique identification numbers respectively having a first predetermined number of bits, respective devices being further configured to store a second predetermined number of bits to be used for random values, respective devices being configured to select random values independently of random values selected by the other devices;

the interrogator being configured to transmit a command requesting devices having random values within a specified group of random values to respond, the specified group being less than or equal to the entire set of random values;

devices receiving the command respectively being configured to determine if their chosen random values fall within the specified group and, if so, send a reply to the interrogator within a randomly selected time slot of a number of possible time slots, in accordance with an Aloha technique; and, if not, not send a reply, wherein sending a reply to the interrogator comprises transmitting both the random value of the device sending the reply and the unique identification number of the device sending the reply, and wherein the time slot randomly selected by a device is selected using a random number different from the random value of that device;

the interrogator being configured to determine if a collision occurred between devices that sent a reply and, if so, create a new, smaller, specified group; and

the interrogator being configured to send a command individually addressed to a device after communicating with a device without a collision.

38. A system in accordance with claim 37 wherein the number of possible time slots is four.

39. A system in accordance with claim 37 wherein the number of possible time slots is four, wherein the first predetermined number of bits is sixteen, and wherein the second predetermined number of bits is sixteen.

40. A system in accordance with claim 37 wherein the number of possible slots varies from one specified group to another.